



National Pollutant Discharge Elimination System

Fact Sheet for

St. Joseph Energy Center

August 2013

Indiana Department of Environmental Management

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Permittee:	St. Joseph Energy Center, LLC c/o Development Partners Group 11 Martine Ave. White Plains, NY 10606
Existing Permit Information:	Permit Number: IN0061422 Expiration Date: Five (5) years from issue date
Source Contact:	Willard Ladd, Manager (914)468-2402 Wladd@developmentpartners.com
Source Location:	54801 Walnut Rd. New Carlisle, IN St. Joseph County
Receiving Stream:	Niespodziany Ditch
Proposed Action:	New Permit Date Application Received: April 12, 2013
Source Category	NPDES Major – Industrial
Permit Writer:	Nikki Gardner, Senior Environmental Manager (317)232-8707 ngardner@idem.in.gov

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1.0 INTRODUCTION

The Indiana Department of Environmental Management (IDEM) received a National Pollutant Discharge Elimination System (NPDES) Permit application from the St. Joseph Energy Center, LLC c/o Development Partners Group on April 12, 2013. A five year permit is proposed in accordance with 327 IAC 5-2-6(a).

The Federal Water Pollution Control Act of 1972 and subsequent amendments require a NPDES permit for the discharge of wastewater to surface waters. Furthermore, Indiana Code (IC) 13-15-1-2 requires a permit to control or limit the discharge of any contaminants into state waters or into a publicly owned treatment works. This proposed permit action by IDEM complies with both federal and state requirements.

In accordance with Title 40 of the Code of Federal Regulations (CFR) Sections 124.8 and 124.56, as well as Indiana Administrative Code (IAC) 327 Article 5, development of a Fact Sheet is required for NPDES permits. This document fulfills the requirements established in those regulations.

This Fact Sheet was prepared in order to document the factors considered in the development of NPDES Permit effluent limitations. The technical basis for the Fact Sheet may consist of evaluations of promulgated effluent guidelines, existing effluent quality, receiving water conditions, and wasteload allocations to meet Indiana Water Quality Standards. Decisions to award variances to Water Quality Standards or promulgated effluent guidelines are justified in the Fact Sheet where necessary.

2.0 FACILITY DESCRIPTION

2.1 General

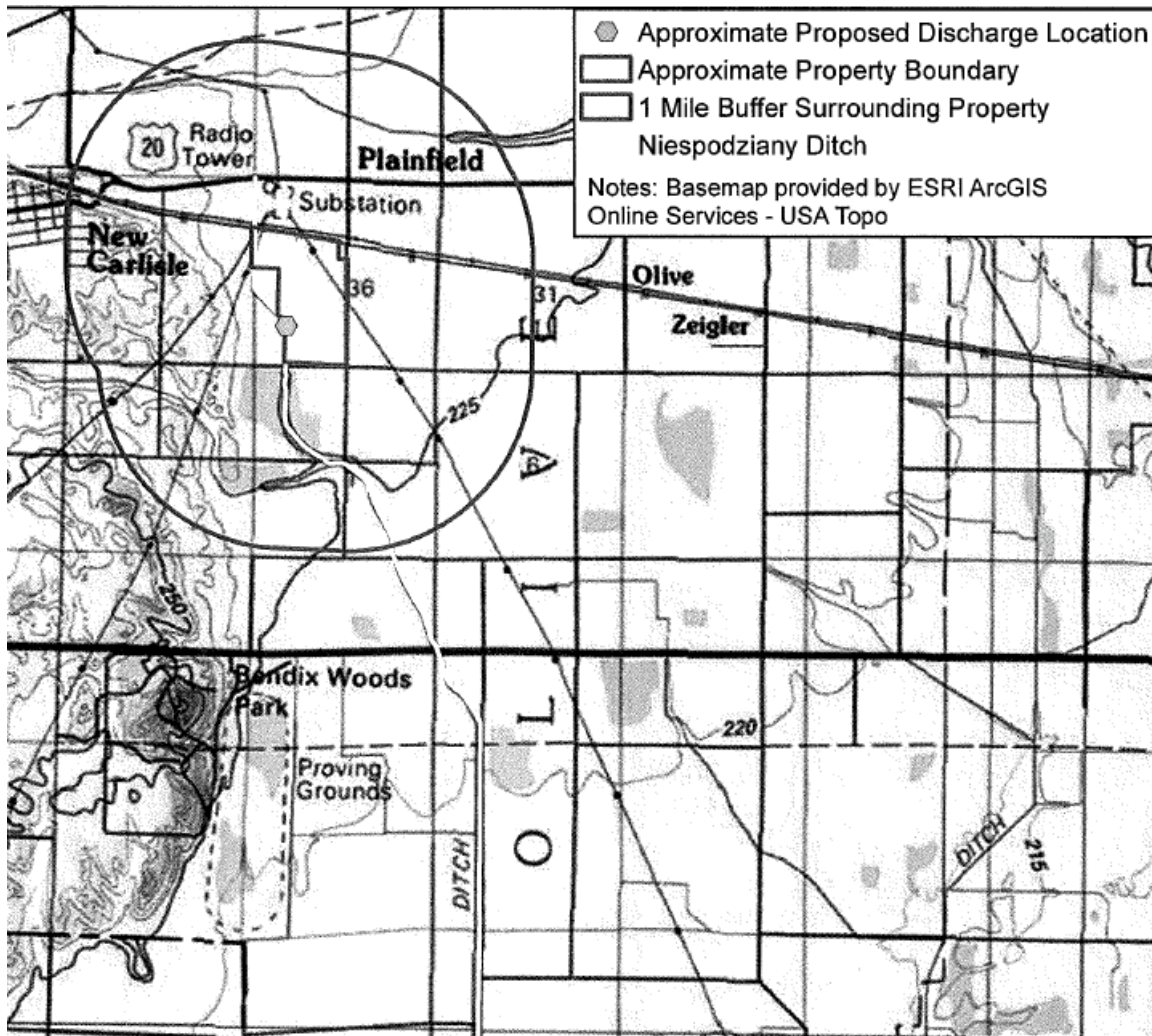
The St. Joseph Energy Center (SJEC) is classified under Standard Industrial Classification (SIC) Code 4911-Electrical Generation and Distribution. The SJEC will be a natural gas-fired combined cycle power generation facility.

St. Joseph Energy Center, LLC (SJEC) is developing the St. Joseph Energy Center (the Project), a 1,345 megawatt (MW) combined cycle gas turbine power plant located on a 165 acre site at the corner of Edison and Walnut Roads within St. Joseph County Economic District 2, in New Carlisle, Indiana. The Project is structured as two separate 670+ MW power blocks and is anticipated to be constructed in two separate phases. The Project's sole fuel source will be natural gas. SJEC is targeting the start of construction on the first phase in late 2013 and commercial operations of the first phase in mid-2016.

As part of the electricity production process utilizing combined cycle technology, the Project will capture exhaust heat from its gas turbines to produce steam, which will drive a steam turbine to

efficiently produce more electricity without utilizing more fuel. The byproduct of this process is heated water, which will be cooled in the Project's cooling towers before being cycled back through the facility. Treated well water will be used as the coolant in these towers. After serving as coolant, the portion of this cooling water that does not evaporate will drain, becoming "blowdown." This blowdown, as well as blowdowns from the Project's specialized water treatment units (collectively, the cooling tower blowdown) will be discharged to the Niespodziany Ditch (the Ditch), which forms the Project's western border. When both phases are operating at full capacity on a hot summer day, the Project is expected to discharge a maximum of up to 4,112 gallons per minute to the Ditch. Discharge for just the first phase during lower temperature will be significantly less than this two phase maximum. Other wastewaters and stormwaters resulting from operation of the Project will be managed via discharge to the City of south Bend POTW or a County-permitted SJEC operated stormwater retention basin located on the Project property, respectively. A map showing the location of the facility has been included as Figure 1.

Figure 1: Facility Location



54801 Walnut Rd.
New Carlisle, IN
St. Joseph County

Latitude: 41° 41' 48.7068" Longitude: -86° 28' 36.7638"

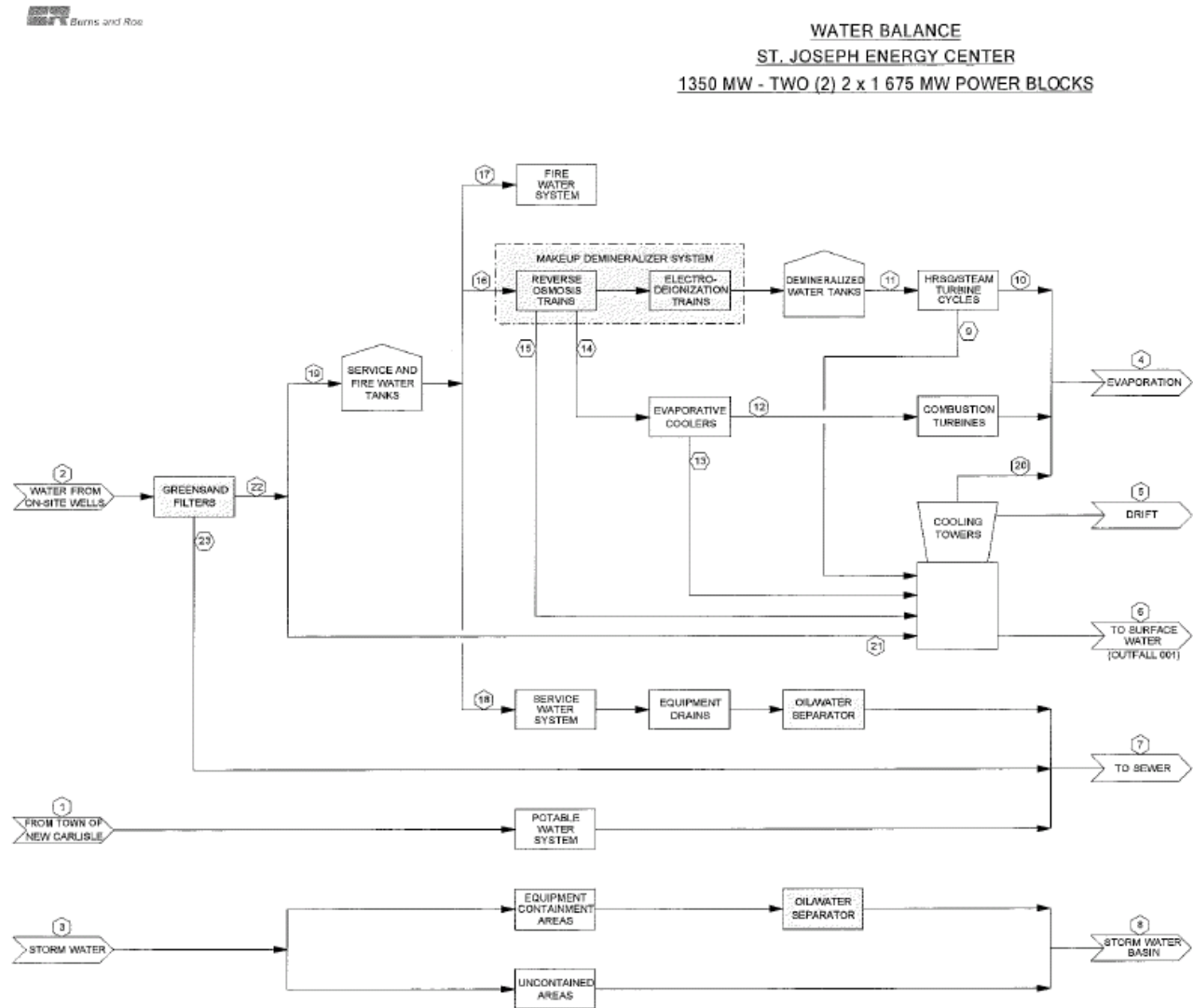
2.2 Outfall Locations

Outfall 001: Latitude: 41° 41' 49.0" Longitude: -86° 28' 59.7"

2.3 Wastewater Treatment

The source water for this facility will be groundwater. The discharge will consist of cooling tower blowdown (RO system, boilers, cooling towers, and dechlorination systems, collectively). Based on the information provided in the 2D application, the cooling tower blowdown is only anticipated to require dechlorination prior to discharge to the Niespodziany Ditch. SJEC is implementing engineering controls and flow management practices to assure that pollutants will not be detectable in the discharge, or will be discharged at levels less than water quality standards. Maximum discharge is expected to be 4,112 gallons per minute (5.9 MGD). A Flow Diagram has been included as Figure 2.

Figure 2: Flow Diagram



CASE	SUMMER
AMBIENT TEMPERATURE, DEG. F	92
RELATIVE HUMIDITY, %	47
FUEL	GAS
DUCT FIRING	ON
EVAPORATIVE COOLER	ON
STEAM TURBINE OPERATION	YES

NUMBER	DESCRIPTION	FLOW RATE
1	TOWN OF NEW CARLISLE WATER SUPPLY	4
2	WATER FROM ON-SITE WELLS	10,517
3	STORMWATER TO EQUIPMENT CONTAINMENT AREAS	0

4	TOTAL EVAPORATION LOSSES	6,337
5	COOLING TOWER DRIFT	1.7
6	DISCHARGE TO SURFACE WATER (COOLING TOWER BLOWDOWN)	4,112
7	DISCHARGE TO SEWER	71
8	DISCHARGE TO STORMWATER BASIN	0

9	HRSG BLOWDOWN	130
10	MISCELLANEOUS LOSSES FROM HRSG/STEAM TURBINE CYCLES	65
11	MAKEUP TO HRSG/STEAM TURBINE CYCLES	195
12	EVAPORATION FROM EVAPORATIVE COOLERS	102
13	EVAPORATIVE COOLER BLOWDOWN	11
14	EVAPORATIVE COOLER MAKEUP	114
15	REVERSE OSMOSIS REJECT	208
16	SERVICE WATER TO MAKEUP DEMINERALIZER SYSTEM	514
17	SUPPLY TO FIRE WATER SYSTEM	0
18	MISCELLANEOUS SERVICE WATER USES	4
19	TOTAL SERVICE AND FIRE WATER USE	518
20	COOLING TOWER EVAPORATION	6,170
21	FILTERED WELL WATER FOR COOLING TOWER MAKEUP	9,937
22	TOTAL FILTERED WELL WATER	10,455
23	GREENSAND FILTER BACKWASH	63

- NOTES: 1. ALL FLOW RATES ARE GALLONS PER MINUTE DURING PEAK OPERATING CONDITIONS.
2. THE ABOVE ASSUMES NO STORMWATER FLOW.
3. THE ABOVE IS BASED ON COOLING TOWER OPERATION AT (2.5) CYCLES OF CONCENTRATION.
4. ALL FLOW RATES ARE FOR TWO (2) 675 MW POWER BLOCKS.

Outfall 001 will have a maximum discharge of approximately 4,112 gallons/minute (5.9 MGD). The permittee shall have the wastewater treatment facilities under the responsible charge of an operator certified by the Commissioner in a classification corresponding to the classification of the wastewater treatment plant as required by IC 13-18-11-11 and 327 IAC 5-22-5. In order to operate a wastewater treatment plant the operator shall have qualifications as established in 327 IAC 5-22-7. Based upon the information provided, IDEM has not given the permittee an industrial wastewater treatment plant classification. This facility has no treatment other than dechlorination; per 327 IAC 5-22-5 dechlorination is not classified.

2.4 Changes in Operation

This is a new NPDES permit.

2.5 Facility Storm Water

The permittee has not requested and is not authorized to discharge storm water. Storm water will be managed via an on-site retention basin that is permitted by St. Joseph County and will be operated by the SJEC. The basin will retain up to a 100-year 24-hour storm event. Storm water will not be discharged from the basin; only evaporation and percolation will occur.

3.0 PERMIT HISTORY

3.1 Compliance history

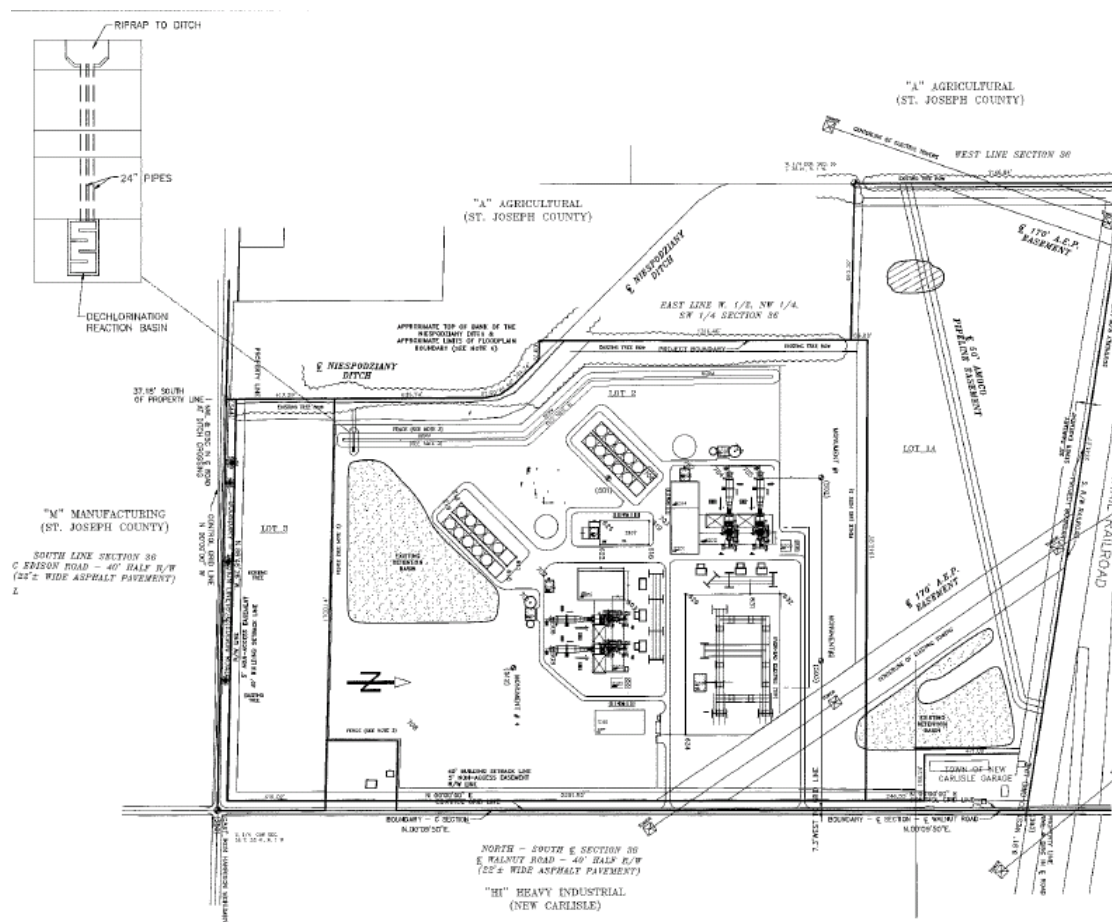
This is a new NPDES permit.

4.0 RECEIVING WATER

The receiving stream for Outfall 001 is the Niespodziany Ditch, a tributary to the Kankakee River. The $Q_{7,10}$ low flow value of the Niespodziany Ditch is 0.0 cfs and shall be capable of supporting a well balanced warm water aquatic community and full body contact recreation in accordance with 327 IAC 2-1-3.

In accordance with 327 IAC 2-1.3, language in this renewed permit specifically prohibits the permittee from undertaking deliberate actions that would result in new or increased discharges of BCC's or new or increased permit limits for non-BCC's, or from allowing a new or increased discharge of a BCC from an existing or proposed industrial user, without first proving that the new or increased discharge would not result in a significant lowering of water quality, or by submission and approval of an antidegradation demonstration to the IDEM. A Site Map has been included as Figure 3.

Figure 3: Site Map



4.1 Receiving Stream Water Quality

Section 303(d) of the Clean Water Act requires states to identify waters, through their Section 305(b) water quality assessments, that do not or are not expected to meet applicable water quality standards with federal technology based standards alone. States are also required to develop a priority ranking for these waters taking into account the severity of the pollution and the designated uses of the waters. Once this listing and ranking of impaired waters is completed, the states are required to develop [Total Maximum Daily Loads \(TMDLs\)](#) for these waters in order to achieve compliance with the water quality standards.

Indiana's 2012 303(d) List of Impaired Waters was developed in accordance with Indiana's Water Quality Assessment and 303(d) Listing Methodology for Waterbody Impairments and Total Maximum Daily Load Development for the 2012 Cycle. The Niespodziany Ditch (Assessment Unit INK0124_03) is on the 2012 303(d) list for Impaired Biotic Communities. A TMDL for E. coli for the Assessment Unit INK0124_03 in 12 Digit HUC 071200010204 has been done for the Kankakee River as part of the Kankakee River/Iroquois River TMDL Study, and approved by U.S. EPA on 9/29/2009.

5.0 PERMIT LIMITATIONS

Two categories of effluent limitations exist for NPDES permits: Technology-Based Effluent Limits (TBELs) and; Water Quality-Based Effluent Limits (WQBELs).

TBELs are developed by applying the National Effluent Limitation Guidelines (ELGs) established by USEPA for specific industrial categories TBELs are the primary mechanism of control and enforcement of water pollution under the Clean Water Act (CWA). Technology based treatment requirements under section 301(b) of the CWA represent the minimum level of control/treatment using available technology that must be imposed in a section 402 permit [40 CFR 125.3(a)].

In the absence of ELGs, effluent limits can also be based upon Best Professional Judgment (BPJ). Accordingly, every individual member of a discharge class or category is required to operate their water pollution control technologies according to industry-wide standards and accepted engineering practices. This means that TBELs based upon a BPJ determination are applied at end-of-pipe and mixing zones are not allowed [40 CFR 125.3(a)]. Similarly, since the statutory deadlines best practicable technology (BPT), best available technology economically achievable (BAT) and best conventional control technology (BCT) have all passed; compliance schedules for these TBELs are also not allowed.

WQBELs are designed to be protective of the beneficial uses of the receiving water and are independent of the available treatment technology. The WQBELs for this facility are based on water quality criteria in 327 IAC 2-1-6 or under the procedures described in 327 IAC 2-1-8.2 through 327 IAC 2-1-8.7 and implementation procedures in 327 IAC 5. Limitations and/or monitoring are required for parameters identified by applications of the reasonable potential to exceed WQBEL under 327 IAC 5-2-11.1 (h)(1).

According to 40 CFR 122.44 and 327 IAC 5, NPDES permit limits are based on either TBELs, where applicable, BPJ, or WQBELs, whichever is most stringent. The decision to limit or monitor the parameters contained in this permit is based on information contained in the permittee's NPDES application. In addition, when performing a permit renewal, existing permit limits must be considered. These may be TBELs, WQBELs, or limits based on BPJ. When renewing a permit, the antibacksliding provisions identified in 327 IAC 5-2-10(11) are taken into consideration.

5.1 Existing Permit Limits – N/A

5.2 Technology-Based Effluent Limits

EPA Effluent Guidelines – New Source Performance Standards (NSPS) found in 40 CFR 423.15. The U.S. EPA has established technology-based effluent guidelines for steam electric generating facilities. The applicable effluent guidelines are as follows:

Requirements applicable to all wastewater streams:

1. pH Control - 40 CFR 423.15(a); The pH of all discharges, except once through cooling water, shall be within the range of 6.0-9.0 s.u.
2. Polychlorinated biphenyl (PCB) - 40 CFR 423.15(b); There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

Regulated wastewater streams and their applicable requirements

There are six (6) separate wastewater streams that are regulated by 40 CFR Part 423, they are:

- 1) Once through non-contact cooling water for a plant with a total rated electric generating capacity of 25 or more megawatts – 40 CFR 423.15(h)(1) and (2)
- 2) Cooling tower blowdown - 40 CFR 423.15(j)(1), (2), and (3)
- 3) Low volume wastewater - 40 CFR 423.15(c)
- 4) Bottom ash transport wastewater - 40 CFR 423.15(f)
- 5) Chemical metal cleaning wastewater - 40 CFR 423.15(d).
- 6) Coal Pile Runoff - 40 CFR 423.15(k)
- 7) Fly ash transport wastewater – Prohibited by 40 CFR 423.15(g).

The table below identifies the stringent guidelines for each wastewater sources.

40 CFR 423.15 – New Source Performance Standards (NSPS)

Wastewater Stream***	pH	Res. Chlorine	TSS		O & G		T. Copper		T. Iron		T. Zinc		T. Chromium	
			Daily Max	Mo. Avg	Daily Max	Mo. Avg	Daily Max	Mo. Avg	Daily Max	Mo. Avg	Daily Max	Mo. Avg	Daily Max	Mo. Avg
Once through non-contact cooling water N/A	n/a	0.2 mg/l*	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cooling tower blowdown Outfall 001	≥ 6.0 s.u. and ≤ 9.0 s.u	0.2 mg/l*	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.0 mg/l	1.0 mg/l	0.2 mg/l	0.2 mg/l
Low volume wastewater**** Outfall 001	≥ 6.0 s.u. and ≤ 9.0 s.u	n/a	100.0 mg/l	30.0 mg/l	20.0 mg/l	15.0 mg/l	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Bottom ash transport wastewater N/A	≥ 6.0 s.u. and ≤ 9.0 s.u	n/a	100.0 mg/l	30.0 mg/l	20.0 mg/l	15.0 mg/l	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Chemical metal cleaning wastewater N/A	≥ 6.0 s.u. and ≤ 9.0 s.u	n/a	100.0 mg/l	30.0 mg/l	20.0 mg/l	15.0 mg/l	1.0 mg/l	1.0 mg/l	1.0 mg/l	1.0 mg/l	n/a	n/a	n/a	n/a
Coal pile runoff N/A	≥ 6.0 s.u. and ≤ 9.0 s.u	n/a	50.0 mg/l**	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

* The discharge of chlorine is limited to a maximum two hours per day for each electrical generating unit.

** This value is an instantaneous limitation (at any time), not a daily maximum.

***When wastewater streams are combined for discharge and/or treatment 40 CFR 423 requires that the quantity of each pollutant or pollutant property controlled attributable to each controlled waste source shall not exceed the specified limitations for that waste source.

****In accordance with 40 CFR 423.11(b), the term low volume waste sources means, taken collectively as if from one source, wastewater from all sources except those for which specific limitations are otherwise established in this part. Low volume wastes sources include, but are not limited to: wastewaters from wet scrubber air pollution control systems, ion exchange water treatment system, water treatment evaporator blow down, laboratory and sampling streams, boiler blow down, floor drains, cooling tower basin cleaning wastes, and recirculating house service water systems. Sanitary and air conditioning wastes are not included.

Total Suspended Solids (TSS) and Oil & Grease (O & G)

TSS and O & G are identified as parameters subject to the federally promulgated effluent limitation guidelines of 40 CFR 423 for this category of discharger. The TSS and O & G effluent limitations are established in accordance with 40 CFR 423.15(c) and are applied due to the presence of boiler blow down, which is a low volume waste by definition. In accordance with 423.11(b) low volume wastes sources include, but are not limited to: wastewaters from wet scrubber air pollution control systems, ion exchange water treatment system, water treatment evaporator blow down, laboratory and sampling streams, boiler blow down, floor drains, cooling tower basin cleaning wastes, and recirculating house service water systems. The TSS effluent limitations are 100 mg/l (daily maximum) and 30 mg/l (monthly average). The O&G effluent limitations are 20 mg/l (daily maximum) and 15 mg/l (monthly average).

Pollutant or pollutant property	NSPS effluent limitations	
	Maximum for any 1 day (mg/l)	Average of daily values for 30 consecutive days shall not exceed (mg/l)
TSS	100.0	30.0
Oil and grease	20.0	15.0

Free Available Chlorine/Total Residual Chlorine (TRC), Total Chromium, Total Zinc, and 126 Priority Pollutants

In accordance with 40 CFR 423.15(j)(1) The quantity of pollutants discharged in cooling tower blowdown shall not exceed the quantity determined by multiplying the flow of cooling tower blowdown times the concentration listed below:

Pollutant or pollutant property	NSPS effluent limitations	
	Maximum concentration (mg/l)	Average concentration (mg/l)
Free available chlorine	0.5	0.2
Pollutant or pollutant property	Maximum for any 1 day (mg/l)	Average of daily values for 30 consecutive days shall not exceed –(mg/l)
The 126 priority pollutants (Appendix A) contained in chemicals added for cooling tower maintenance, except:	(¹)	(¹)
Chromium, total	0.2	0.2
Zinc, total	1.0	1.0

¹ No detectable amount.

Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than two hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the Regional Administrator or State, if the State has NPDES permit issuing authority, that the units in a particular location cannot operate at or below this level of chlorination.

At the permitting authority's discretion, instead of the monitoring in 40 CFR 122.11(b), compliance with the limitations for the 126 priority pollutants in paragraph (j)(1) of this section may be determined by engineering calculations which demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR part 136.

5.3 Water Quality-Based Effluent Limits

The water quality-based effluent limitations for this facility are based on water quality criteria in 327 IAC 2-1.5-8 or under the procedures described in 327 IAC 2-1.5-11 through 327 IAC 2-1.5-16 and implementation procedures in 327 IAC 5.

Narrative Water Quality Based Limits

The narrative water quality contained under 327 IAC 2-1.5-8(b)(1) (A)-(E) have been included in this permit to ensure that the narrative water quality criteria are met.

Numeric Water Quality Based Limits

The numeric water quality criteria and values contained in this permit have been calculated using the tables of water quality criteria under 327 IAC 2-1.5-8(b) & (c).

Flow

The permittee's flow is to be monitored in accordance with 327 IAC 5-2-13(a)2.

pH

Limitations for pH in the proposed permit are taken from 327 IAC 2-1.5-8(c)(2).

Total Residual Chlorine (TRC), Chromium (Total), and Zinc

IDEM developed a Wasteload Allocation Report (WLA001986) for the St. Joseph Energy Center New Carlisle Plant on June 21, 2013. WLA001986 established the following water quality based effluent limitations (WQBEL):

	<u>Monthly Average</u>	<u>Daily Maximum</u>
TRC	0.01 mg/l	0.02 mg/l
Chromium, Total	0.49 mg/l	0.99 mg/l
Zinc	0.26 mg/l	0.52 mg/l

Mercury

New mercury analytical and sampling methodology provide for limits of detection and quantification at levels below the water quality criterion, and the IDEM is requiring major NPDES dischargers to utilize these methodologies to determine if their discharges have reasonable potential to exceed the water quality criterion.

The NPDES permit requires that mercury sampling be conducted bi-monthly in the months of February, April, June, August, October, and December of each year for the term of the permit. This shall be achieved by either installing appropriate analytical facilities or by obtaining the services of a commercial laboratory.

The permittee may submit a request for review of monitoring data after the first year of sampling has been completed using EPA Test Method 1631, Method E. The permit may be modified to reduce monitoring requirements for mercury if it is found that it will not be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an excursion (RPE) above a water quality criteria. Conversely, effluent limits and monitoring requirements shall be added to the permit if RPE exists. If RPE does not exist, any reduction of monitoring will remain in effect only during the term of the renewal of the permit and as long as there are no modifications to the wastewater treatment facilities and/or significant changes to the influent flow characteristics of the wastewater treatment facility.

Temperature

See Section 6.4 of this document for a detailed discussion on Thermal Effluent Limitations and Alternate Thermal Effluent Limitations Requirements.

5.4 Whole Effluent Toxicity

The permit does not contain a requirement to conduct WETT testing.

5.5 Antibacksliding

As this permit is for a proposed new facility, backsliding regulations do not apply.

5.6 Antidegradation

327 IAC 2-1.3 outlines the state's Antidegradation Standards and Implementation Procedures. The Tier 1 antidegradation standard found in 327 IAC 2-1.3-3(a) applies to all surface waters of the state regardless of their existing water quality. Based on this standard, for all surface waters of the state, existing uses and the level of water quality necessary to protect existing uses shall be maintained and protected. IDEM implements the Tier 1 antidegradation standard by requiring NPDES permits to contain effluent limits and best management practices for regulated pollutants that ensure the narrative and numeric water quality criteria applicable to the designated use are achieved in the water and any designated use of the downstream water is maintained and protected. Effluent limits for the following regulated pollutants are being included in this NPDES permit to satisfy the Tier 1 antidegradation standard: TSS and O & G

The Tier 2 antidegradation standard found in 327 IAC 2-1.3-3(b) applies to surface waters of the state where the existing quality for a parameter is better than the water quality criterion for that parameter established in 327 IAC 2-1.5. These surface waters are considered high quality for the parameter and this high quality shall be maintained and protected unless the commissioner finds that allowing a significant lowering of water quality is necessary and accommodates important social or economic development in the area in which the waters are located. IDEM implements the Tier 2 antidegradation standard for regulated pollutants with numeric water quality criteria quality adopted in or developed pursuant to 327 IAC 2-1.5 and utilizes the antidegradation implementation procedures in 327 IAC 2-1.3-5 and 2-1.3-6.

According to 327 IAC 2-1.3-1(b), the antidegradation implementation procedures in 327 IAC 2-1.3-5 and 2-1.3-6 apply to a proposed new or increased loading of a regulated pollutant to surface waters of the state from a deliberate activity subject to the Clean Water Act, including a change in process or operation that will result in a significant lowering of water quality.

The NPDES permit establishes a new or increased loading of TRC, Total Chromium, and Zinc that will result in a significant lowering of water quality in accordance with 327 IAC 2-1.3-2(50), therefore, the Antidegradation Implementation Procedures in 327 IAC 2-1.3-5 and 2-1.3-6 apply to the new loadings of TRC, Total Chromium, and Zinc in the permitted discharge. The finding of significant lowering was determined by conducting a wasteload allocation (WLA) analysis. The WLA was completed by Office of Water Quality (OWQ) Permits Branch staff on June 21, 2013.

In accordance with 327 IAC 2-1.3-5, the St. Joseph Energy Center submitted an antidegradation demonstration on April 12, 2013 for a new discharge of wastewater from a proposed combined-cycle gas turbine power plant. IDEM reviewed the antidegradation demonstration and found it to be complete on April 19, 2013. The receipt of a complete antidegradation demonstration was public noticed on April 26, 2013 in the South Bend Tribune for 30 days to solicit comments from the public. The public comment period ended on May 27, 2013.

The commissioner of IDEM has made a tentative determination on the antidegradation demonstration to approve the proposed new discharge of wastewater from the proposed combined-cycle gas turbine power plant into the Niespodziany Ditch. The following is a summary of the factors considered in making the tentative decision.

- TRC: SJEC is implementing engineering controls and flow management practices to assure that TRC will not be detectable in the discharge. The effluent will be dechlorinated prior to discharge.
- Chromium (Total) and Zinc: SJEC operations will not add incremental chromium or zinc to the water cycled through the facility, therefore the projected effluent quality for chromium and zinc is based on the levels measured in the groundwater that will supply the facility. However, the cycling of cooling water through the cooling towers will increase the concentration of chromium and zinc in the effluent relative to the groundwater supplying the facility. In order to manage these concentrations the SJEC has engineered the Project to minimize the number of cooling tower cycles.
- SJEC considered the availability, reliability, cost effectiveness, and technical feasibility of (1) No degradation, (2) Minimal degradation, and (3) Degradation mitigation techniques or alternatives. For this type of discharge, the options for “no degradation” and “minimal degradation” are the same; that there must be no discharge. Degradation mitigation techniques would consist of zero liquid discharge, discharge to the South Bend POTW, or discharge to the Kankakee River. These options were all deemed infeasible for economic and multimedia impact; economic and operational uncertainty; and economics and timing, respectively.

- SJEC conducted an alternatives analysis, including a zero discharge scenario and a reroute to the Kankakee River. However, neither alternative appears to be feasible. The City of South Bend POTW indicated it would face significant challenges accepting the projected flows, and could not guarantee continued acceptance for the life of the facility. Rerouting the discharge 17 miles to the Kankakee River is unlikely to be feasible due to multiple regulatory jurisdictions, land acquisition, zoning, and permitting issues.
- SJEC has concluded that the social and economic benefits of the plant include job creation, economic stimulus, improved income, and reduced unemployment and poverty. SJEC believes that the Project has the potential to improve water quality in the Project area, and in doing so result in improved value for angling and other outdoor recreational activities. The clean and in-state source of power will generate improved quality of life measures, and reduce the need to import power from other states. The steady source of power will meet the growing need for electricity and strengthen economic competitiveness in St. Joseph County and the neighboring areas. The Project will expand municipal fiscal resources without putting additional stress on social services.
- On April 26, 2013, the St. Joseph County Drainage Board approved a discharge rate of 9 cfs (6 MGD) to the Niespodziany Ditch based on the following conditions: (1) Development Partners supplies the funding necessary to replace the two private field culverts as identified and based on the recommendations cited in the hydraulic analysis report prepared by DLZ Indiana LLC and (2) Development Partners provides the funding necessary to clean or dredge the Niespodziany Ditch from S.R. 2 to the north property line of the proposed Energy Plant site (Norfolk Southern Railroad).
- SJEC is having ongoing discussions with the County regarding water withdrawal. Given the prolific nature of the aquifer it is believed that the Project's potential maximum withdrawal will not affect nearby wells.

The permittee is prohibited from undertaking any deliberate action that would result in a new or increased discharge of a bioaccumulative chemical of concern (BCC) or a new or increased permit limit for a pollutant or pollutant parameter that is not a BCC unless information is submitted to the commissioner demonstrating that the proposed new or increased discharge will not cause a significant lowering of water quality, or an antidegradation demonstration submitted and approved in accordance 327 IAC 2-1.3.

5.7 Stormwater

Please refer to Section 2.5 of this Fact Sheet.

5.8 Water Treatment Additives

In the event that changes are to be made in the use of water treatment additives that could significantly change the nature of, or increase the discharge concentration of the additive contributing to Outfall 001, the permittee shall notify the Indiana Department of Environmental Management as required in Part II.C.1 of this permit. The use of any new or changed water

treatment additives or dosage rates shall not cause the discharge from any permitted outfall to exhibit chronic or acute toxicity. Acute and chronic aquatic toxicity information must be provided with any notification regarding any new or changed water treatment additives or dosage rates.

6.0 PERMIT DRAFT DISCUSSION

6.1 Discharge Limitations

Outfall 001

Parameter	Monthly Average	Daily Maximum	Units	Monthly Average	Daily Maximum	Units	Source of Applicable Limits
Flow	Report	Report	MGD	----	----	----	327 IAC 5
TSS	----	----	----	30	100	mg/l	TBEL
O & G	----	----	----	15	20	mg/l	TBEL
TRC	----	----	----	0.01	0.02	mg/l	WQBEL
Temperature	----	----	----	Report	Report	°F	316(a)
Zinc	----	----	----	0.26	0.52	mg/l	WQBEL
Chromium	----	----	----	0.2	0.2	mg/l	TBEL
126 Priority Pollutants	----	----	----	(1)	(1)	(1)	TBEL
Mercury	----	----	----	----	Report	ng/l	WQBEL

Parameter	Daily Minimum	Daily Maximum	Units	Source of Applicable Limits
pH	6.0	9.0	Std Units	WQBEL

⁽¹⁾ No detectable amount. Instead of the monitoring in 40 CFR 122.11(b), compliance with the limitations for the 126 priority pollutants may be determined by engineering calculations which demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR part 136.

6.2 Monitoring Conditions and Rationale

Analytical and sampling methods used shall conform to the current version of 40 CFR 136 as referenced in 327 IAC 5-2-13(d)(1). The monitoring conditions proposed are comparable to those in permits regulating similar types of discharges.

Outfall 001

Parameter	Minimum Frequency	Type of Sample
Flow	Daily	24 Hr. Total
TSS	1 X Week	Grab
O & G	1 X Week	Grab

TRC	1 X Week	Grab
Temperature	Daily	Grab
Zinc	2 X Month	24 Hr. Composite
Chromium	2 X Month	24 Hr. Composite
126 Priority Pollutants	⁽¹⁾	Report
pH	Daily	Grab

⁽¹⁾ At least once per permit cycle

6.3 Schedule of Compliance

This is a new permit, therefore the discharge isn't eligible for a schedule of compliance.

6.4 Special Conditions

6.4.1 CWA Section 316(a) Alternative Thermal Effluent Limitations (ATEL)

Applicability, Purpose and Scope

The regulations applicable to dischargers requesting alternative thermal effluent limitations (ATEL) as allowed by section 316(a) of the Clean Water Act (CWA) are found in 40 CFR 125 subpart H and 327 IAC 5-7. 40 CFR 125 subpart H and 327 IAC 5-7 describe the factors, criteria and standards for the establishment of alternative thermal effluent limitations under section 316(a) of the Act in permits issued under section 402(a) of the Act.

With respect to any point source otherwise subject to the provisions of section 301 or section 306 of this Act, whenever the owner or operator of any such source, after opportunity for public hearing, can demonstrate to the satisfaction of the Administrator (or, if appropriate, the State) that any effluent limitation proposed for the control of the thermal component of any discharge from such source will require effluent limitations more stringent than necessary to assure the protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife in and on the body of water into which the discharge is to be made, the Administrator (or, if appropriate, the State) may impose an effluent limitation under such sections on such plant, with respect to the thermal component of such discharge (taking into account the interaction of such thermal component with other pollutants), that will assure the protection and propagation of a balanced indigenous population of shellfish, fish and wildlife in and on that body of water.

Criteria and standards for the determination of alternative effluent limitations

Thermal discharge effluent limitations or standards established in permits may be less stringent than those required by applicable standards and limitations if the discharger demonstrates to the satisfaction of the IDEM that such effluent limitations are more stringent than necessary to assure the protection and propagation of a balanced, indigenous community of shellfish, fish and wildlife in and on the body of water into which the discharge is made. This demonstration must show that the alternative effluent limitation desired by the discharger, considering the cumulative impact of its thermal discharge together with all other significant impacts on the species affected,

will assure the protection and propagation of a balanced indigenous community of shellfish, fish and wildlife in and on the body of water into which the discharge is to be made.

In determining whether or not the protection and propagation of the affected species will be assured, the IDEM may consider any information contained or referenced in any applicable thermal water quality criteria and thermal water quality information published by the Administrator under section 304(a) of the Act, or any other information he deems relevant.

St. Joseph Energy Center's 316(a) Demonstration and ATEL Request Summary

The St. Joseph Energy Center submitted a "Request for Alternative Thermal Effluent Limits" for a proposed 1,345 megawatt (MW) combined cycle gas turbine power plant to be located just east of New Carlisle in St. Joseph County. This will be a natural gas fueled facility structured as two 670+ MW power blocks. Construction is expected to be in two phases. Once on line, treated groundwater will be used as the coolant in cooling towers. After serving as a coolant, the portion of this cooling water that does not evaporate will drain, becoming "blowdown." This blowdown, as well as blowdown from the specialized water treatment units will be discharged to the Niespodziany Ditch. Niespodziany Ditch forms the western and southern border of the project's property. When both phases of the construction are completed and the plant fully operational, the expected discharge will be up to 4,112 gallons per minute or 5.9 million gallons per day (MGD).

Niespodziany Ditch, along the property border and discharge point of the facility is a first order stream. It has a straight morphology collecting and transporting agricultural and storm water runoff. No other specific discharges to the ditch are known to exist. Just downstream of the property (south of Edison Rd.) a tributary connects to Niespodziany Ditch. In the original ATEL request, the SJEC referred to this as Laskowski Ditch. The SJEC has provided a correction, explaining that Laskowski Ditch is actually located to the east of Niespodziany and does not connect to it. The connecting ditch from the west and just downstream of Edison Rd. is called Hooten Ditch. Niespodziany Ditch flows south for approximately 7+ miles, gathering discharge from a few other artificial agricultural drainage ditches, eventually having confluence with the upper Kankakee River.

It has been stated that Niespodziany Ditch, at least in the reach of the project, is an ephemeral stream with very limited habitat to support an aquatic community. On May 29, 2013 IDEM visited the ditch at the south end of the project property (Edison Rd.) and two other locations further downstream. After performing some rough measurements IDEM found the flow of the stream to be at about 1.7 cubic feet per second (cfs) or about 1.1 MGD on that day. IDEM observed fish and even captured a young-of-the-year grass pickerel (*Esox americanus*) at this location. Although not at summer low flow, the flow of the stream was gentle and clarity good. The average stream depth was about 0.15 meters. This observation leads IDEM to believe that the ditch may be more perennial at this point in the ditch than previously thought.

Species Recruitment

A cursory assessment of the habitat potential in Niespodziany Ditch revealed varieties of small refugia or in-stream cover including overhanging vegetation, shallow, pools, logs and woody debris, submerged aquatic macrophytes, and abundant bank-side vegetation. Although not deep, the depths observed were typical of first order streams. Although channel morphology is poor in this stream and riparian zones very narrow there is a variety of habitat amenable to pioneer species typical of first and second order streams. However, recruitment, even in the absence of a temperature barrier, may be problematic. St. Joseph Energy Center estimates peak discharge will eventually be 5.9 MGD. This will essentially increase the flow of the ditch by 3.5 times. Although it appears that the depth and width of the ditch is such that it can handle this volume, Niespodziany ditch will be in a high water condition/state year round. With this increased flow and therefore velocity, stability of the stream channel and biological recruitment will be inhibited. The increased volume as well as elevated water temperature from the discharge will have some affect on the bank-side vegetation as well. Also because the entire flow and temperature of the ditch will now be governed by the discharge, this will exclude viable zones of passage as well as create thermal barriers to recruitment from side ditches, tributaries and from the Kankakee River.

UILT

SJEC has proposed alternative effluent temperature limitations for all months except June, July, August, and September (32.2 °C). SJEC has proposed a daily maximum temperature limit (expressed as a 24-hour average) coupled with a weekly average temperature limit for each calendar month based on projected cooling tower performance. The daily maximum temperature proposal is based on the upper incipient lethal temperature (UILT) for a 7-day exposure for creek chub (*Semotilus atromaculatus*). The UILT is an estimate of acute (short-term) exposure maximum temperature relative to a previous acclimation temperature. It is the temperature at which 50% of the test organisms die within a 1- or 7-day exposure period, given a previous acclimation to a constant lower temperature that is within the zone of tolerance of the organism. In Niespodziany Ditch there will essentially be no zones of passage or in-channel refugia from elevated temperatures for fish. Generally the preferred UILT to select would be the median value from studies rather than the highest from any one study. In addition, the U.S. EPA recommends a Margin of Safety (MOS) of 2 °C below the Ultimate Upper Incipient Lethal Temperature (UUILT). The State of Colorado has recommended and implemented a formula for developing an MOS based on the difference between the UILT and an optimum temperature (OT) or preferred temperature (PT). Because differences in UILT and OT can vary among species the hard and fast 2 °C MOS is not always appropriate. A MOS is subtracted from the species-specific lethal values to take the acute criterion from a lethal level to a sub-lethal level.

MOS is equal to 1/5 the distance between the median UILT/UUILT and the Upper Optimum.

$$0.20 * (\text{Median UILT/UUILT} - \text{Upper Optimum}) = \text{MOS}$$

SJEC listed an UILT of 32.3 °C (90.1 °F). This is a critical maximum temperature from one of three studies listed by Wismer and Christie (1987). Utilizing the preferred maximum

temperature of 22 °C (71.6 °F) as a surrogate for the OT, the MOS corrected UILT is 30.2 °C (86.4 °F).

The range of critical maximum temperatures listed is 30.3-32.3 °C with a mean of 31.4 °C (88.5 °F). The calculated MOS corrected maximum temperature (utilizing a preferred temp of 22 °C (71.6 °F) as a surrogate for the OT) for a daily maximum temperature is 29.5 °C (85.1 °F).

New Mexico Environmental Department lists a median UILT of 30.8 °C (87.4 °F) for creek chub.

Yoder recently listed the UILT for creek chub at 33.7 °C (92.7 °F) with an optimal temperature of 28.1 °C (82.6 °F). (ORSANCO fish temperature criteria re-evaluation, 2006). The MOS corrected UILT for a daily maximum temperature is 32.6 °C (90.7 °F).

The average MOS corrected daily maximum temperature from the four above scenarios for protection of creek chub from acute maximum temperature is 30.8 °C (87.4 °F).

A review of spotfin shiner (*Cyprinella spiloptera*): UILT 30.7 °C (87.3 °F) for juveniles and PT 25 °C (77.0 °F). MOS corrected UILT for a daily maximum temperature is 29.6 °C (85.3 °F). Protection of juvenile spotfin shiner will be protective for all other listed species.

MWAT

SJEC has also proposed a mean weekly average temperature limit based on the maximum weekly average temperature (for the most thermally sensitive fishy (creek chub) with 100% survival of 27 °C (80.6 °F). However at issue are spawning, reproduction and early life stage considerations during critical months. The temperature variance proposed has the ditch essentially at a constant temperature year round. Seasonality is an essential element to aquatic life cycles and histories in Midwestern streams and rivers.

Sensitive life-stages (e.g., eggs and fry) and critical activities (e.g., migrations, spawning, feeding) related to reproduction need to be considered when developing temperature limits. The temperatures during spawning seasons (March through June) must be protective of the offspring (i.e., eggs, fry, early life stages). As stated above SJEC is proposing alternate temperature limits for all months except June, July, and August. SJEC needs to ensure that normal seasonal temperature patterns are maintained so that winter temperatures will be substantially cooler than summer temperatures. IDEM believes that the temperature variance that SJEC has proposed does not allow for this. A lowering from the summer values sets the temperature below the threshold that triggers spawning in warm-water fish. This should ensure that fish are not being induced to spawn in the winter by anthropogenic warming, when food is scarce and/or the appropriate habitat may not be available. It also ensures that the life cycles of the benthic dwelling invertebrates, which are a substantial part of the food base for many first and second order stream inhabiting fish, as well as aquatic life stages of amphibians, are also not disrupted. Therefore maximum daily temperature of 32.3 °C (90.1 °F) and a weekly mean of 27 °C (80.6 °F) during the winter months are not conducive to a well balanced and reproducing aquatic community. These high winter time water temperatures will also create extreme thermal barriers

to winter time migration recruitment when the few tributaries to Niespodziany Ditch could be as much as 25 °C colder than Niespodziany Ditch.

SJEC Table 3 of the ATEL request lists SJEC blowdown projected weekly temperatures for January as 18.4 °C (65.1 °F), February 17.6 °C (63.6 °F), March 25.2 °C (77.3 °F), and December 18.1 °C (64.6 °F). These projected temperatures provide for seasonality and will minimize extreme temperature barriers and gradients during the winter months. These temperatures will be more amenable to successful spawning by more sensitive pioneering species such as white sucker.

Conclusion

IDEM proposes that with the exception of June through September, the daily maximum temperature be limited to 29.6 °C (85.3 °F) based on protection of juvenile spotfin shiner, and again with the exception of June through September, the maximum weekly average temperature be limited to 27 °C (80.6 °F) for the months of April, May, October and November based on protection of adult creek chub. The temperature limitations proposed for June through September are the Water Quality Based Effluent Limitations. The proposed temperature limitations should assure the protection and propagation of a balanced indigenous community of shellfish, fish and wildlife in and on the body of water into which the discharge is to be made, and protect against mortality of important species if the elevated plume temperature is suddenly dropped to the ambient temperature. For the winter months of December through March, IDEM suggests that the alternate daily maximum limit and the maximum weekly average temperature be no more than the projected daily maximum and projected weekly average temperatures as listed for each of these respective months in SJEC Table 3, plus a 2 °C margin of safety to allow for minor operational variability and seasonality. The temperature needs to maintain a normal pattern of diel and seasonal fluctuations and spatial diversity with no abrupt changes and shall have no increase in temperature of magnitude, rate, and duration deleterious to aquatic life. At the expiration of the permit, the SJEC should be prepared to support the continuation of the variance with studies based on the discharger's actual operation experience.

WQBEL vs. Proposed ATEL

Water Quality Based Effluent Limitations Table
(Applicable in the absence of an approved ATEL)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
°F	50	50	60	70	80	90	90	90	90	78	70	57
°C	10	10	15.6	21.1	26.7	32.2	32.2	32.2	32.2	25.5	21.1	14

Proposed ATEL Table: Daily Maximums

	Jan	Feb	Mar	Apr	May	Jun*	Jul*	Aug*	Sep*	Oct	Nov	Dec
°F	77.5	73.6	82.6	85.3	85.3	90	90	90	90	85.3	85.3	75.4
°C	25.3	23.1	28.1	29.6	29.6	32.2	32.2	32.2	32.2	29.6	29.6	24.1

Proposed ATEL Table: Maximum Weekly Averages

	Jan	Feb	Mar	Apr	May	Jun*	Jul*	Aug*	Sep*	Oct	Nov	Dec
°F	68.7	67.3	80.6	80.6	80.6	90	90	90	90	80.6	80.6	68.2
°C	20.4	19.6	27.0	27.0	27.0	32.2	32.2	32.2	32.2	27.0	27.0	20.1

Monitoring and reporting of the discharge temperature is to occur on a continuous basis and measurements shall be recorded at a frequency of once per hour. The highest single recorded measurement for each day shall be reported on the state monthly monitoring report and on the federal discharge monitoring report as the maximum daily temperature of that day. The highest calculated weekly average shall be reported on the state monthly monitoring report and on the federal discharge monitoring report as the maximum weekly average.

* At no time shall the water temperature at such locations exceed the maximum limits in the tables above by more than three degrees Fahrenheit (3°F) (one and seven-tenths degrees Celsius (1.7°C)).

6.4.2 Polychlorinated Biphenyl Compounds (PCB)

There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid. In order to determine compliance with the PCB prohibition, the permittee shall provide PCB data for Outfall 001 within six (6) months after first discharge.

<u>Pollutant</u>	<u>Test Method</u>	<u>LOD</u>	<u>LOQ</u>
PCBs*	EPA 608	0.1 ug/L	0.3 ug/L

*PCB 1242, 1254, 1221, 1232, 1248, 1260, 1016

6.4.3 126 Priority Pollutants

The 126 priority pollutants (Appendix A) contained in chemicals added for cooling tower maintenance, except Total Chromium and Zinc, shall not be discharged in detectable amounts. Instead of the monitoring in 40 CFR 122.11(b), compliance with the limitations for the 126 priority pollutants may be determined by engineering calculations which demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR part 136. Monitoring results or engineering calculations must be submitted to IDEM with six (6) months after first discharge and with every permit renewal application thereafter.

6.5 Spill Response and Reporting Requirement

Reporting requirements associated with the Spill Reporting, Containment, and Response requirements of 327 IAC 2-6.1 are included in Part II.B.2.(d), Part II.B.3.(c), and Part II.C.3. of the NPDES permit. Spills from the permitted facility meeting the definition of a spill under 327 IAC 2-6.1-4(15), the applicability requirements of 327 IAC 2-6.1-1, and the Reportable Spills

requirements of 327 IAC 2-6.1-5 (other than those meeting an exclusion under 327 IAC 2-6.1-3 or the criteria outlined below) are subject to the Reporting Responsibilities of 327 IAC 2-6.1-7.

It should be noted that the reporting requirements of 327 IAC 2-6.1 do not apply to those discharges or exceedances that are under the jurisdiction of an applicable permit when the substance in question is covered by the permit and death or acute injury or illness to animals or humans does not occur. In order for a discharge or exceedance to be under the jurisdiction of this NPDES permit, the substance in question (a) must have been discharged in the normal course of operation from an outfall listed in this permit, and (b) must have been discharged from an outfall for which the permittee has authorization to discharge that substance.

6.6 Permit Processing/Public Comment

Pursuant to IC 13-15-5-1, IDEM will publish a general notice in the newspaper with the largest general circulation within the above county. A 30-day comment period is available in order to solicit input from interested parties, including the general public. Comments concerning the draft permit should be submitted in accordance with the procedure outlined in the enclosed public notice form.